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COMPLETE SPECIFICATION

1 SHEET

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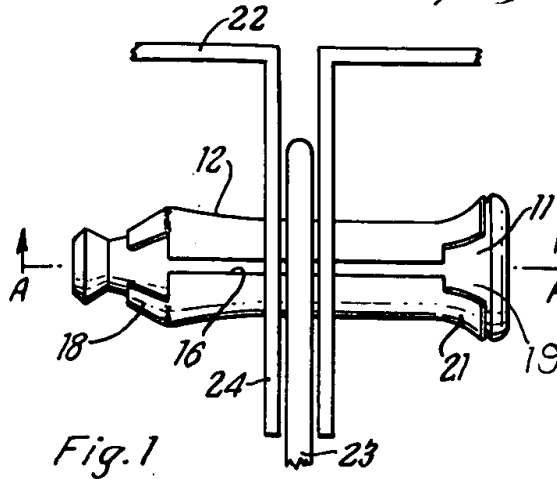


Fig. 1

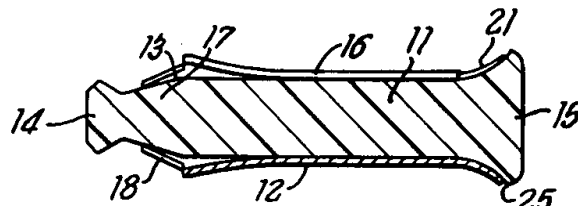


Fig. 2

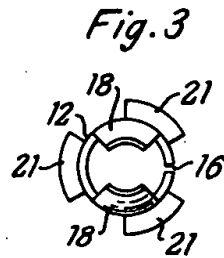


Fig. 3

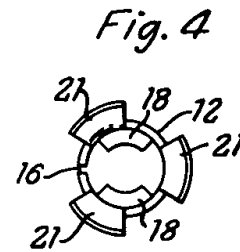


Fig. 4



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(54) CLIPS

(71) We, UNITED-CARR LIMITED, a British company of 57, Chiswell Street, London EC14 4FY, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to clips for joining two members together and is particularly applicable to clips which are required to withstand a considerable shear but which can be removed to enable the two members to be separated.

A particular application of such a clip is in the vehicle industry where there is a demand for a clip in an assembly fitted to a vehicle door restraint strap to limit the opening of the door.

According to the present invention a clip for joining two apertured members together comprises a split metal sleeve, a body of a plastics material which can be passed into the sleeve, and co-operating means on the sleeve and the body preventing axial movement of the sleeve relative to the body when the body is within the sleeve.

The metal sleeve provides the clip with shear strength and the plastics body expands the metal sleeve. The clip may be quickly assembled at less cost than clips which have previously been proposed. The clip may prevent or reduce rattle and can easily be removed if required.

A preferred embodiment of the invention will now be described by way of example with reference to the accompanying drawings, of which:—

Figure 1 is a side elevation of a clip joining two parts together,

Figure 2 is a section on the line A—A of Figure 1, taken through the clip only;

Figure 3 is a view from one end of a sleeve forming part of the clip, and

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Figure 4 is a view from the other end of the sleeve.

The clip shown in Figure 1 and 2 comprises a body 11 of a plastics material such as an acetal resin and a split metal sleeve 12. The body 11 has a double-tapered neck 13 at one end and a head 14 integral with the neck. At its end opposite the head 14 the body 11 is formed with a tail 15 whose cross-sectional area gradually increases towards its free end. The diameter of the body 11 is slightly larger than that of the sleeve 12.

The split sleeve 12 has a longitudinal gap or slit 16 over its entire length which permits the sleeve to expand and has two cut-outs 17 at one end forming two opposite inwardly inclined fingers, one of which is shown at 18. The inclination of the fingers is greater than the taper of the neck 13. At the other end, the sleeve has three cut-outs such as that shown at 19 so as to form three outwardly inclined fingers, one of which is shown at 21.

The clip illustrated may be used to join two parts 22 and 23 together in the manner shown in Figure 1. The part 23 engages with the door of a vehicle and the part 22 is attached to the body of the vehicle. The part 22 is pivotable about the longitudinal axis of the clip while the part 23 is rigid with the clip.

The parts are joined by passing the sleeve 12 through co-axial holes in the part 23 and in flanges 24 of the member 22, the holes in the flanges being slightly larger than the hole in the part 23. The body 11 is then forced into the sleeve, with its head 14 leading. The body 11 has a greater cross-sectional area than the sleeve in its unexpanded state so that as the body 11 enters the sleeve, the sleeve expands due to the longitudinal slit 16 until it fits tightly within the holes in the part 23. After the head

14 has passed the fingers 18, the fingers 18 move outwardly as they engage the tapered neck 13. This causes the part of the sleeve beyond the parts 22 and 23 to expand as shown in Figure 2. Further movement of the body relative to the sleeve is prevented by the engagement between the fingers 21 and an inclined surface 25 on the tail portion of the body 11. Thus the body 11 cannot be removed from the sleeve since the head 14 prevents further movement of the sleeve in one direction and the tail portion 15 prevents movement in the opposite direction.

Such a clip will withstand a considerable amount of shear which may be caused when the vehicle door is opened. If, however, it is necessary for the two parts to be disconnected so that the door can be removed all that is necessary is for the head 14 of the body 11 to be severed so as to permit the body to be removed when the sleeve can then be knocked out.

Various modifications may be made to the embodiment described. For example, the sleeve may have only two fingers 21 or it may be provided with four or more fingers instead of the three fingers described.

#### WHAT WE CLAIM IS:—

1. A clip for joining two apertured members together comprising a split metal sleeve, a body of a plastics material which can be passed into the sleeve, and co-operating means on the sleeve and the body preventing axial movement of the sleeve relative to the body when the body is within the sleeve.

2. A clip as claimed in claim 1 in which one end of the sleeve is tapered inwardly, and the body has a head and a neck such that when the body is passed head first into the sleeve from the other end of the sleeve the tapered end of the sleeve engages about the neck of the body, the tapered end and the head and neck forming co-operating means for preventing axial movement of the

sleeve relative to the body in at least one direction.

3. A clip as claimed in claim 2 in which the inwardly tapered end of the sleeve is formed by two inwardly inclined fingers situated on opposite sides of the sleeve.

4. A clip as claimed in any of the preceding claims in which the said other end of the sleeve is tapered outwardly.

5. A clip as claimed in claim 4 in which the said other end of the sleeve is formed by at least two outwardly extending fingers.

6. A clip as claimed in claim 4 or claim 5 in which the body has a tail portion at its end remote from the head, the tail portion having a gradually increasing cross-sectional area towards its free end whereby when the body is within the sleeve the tail portion co-operates with the outwardly tapered end of the sleeve to prevent movement of the sleeve relative to the body in the opposite axial direction.

7. A clip as claimed in any of the preceding claims in which the cross-sectional area of the body is greater than that of the sleeve in its unexpanded state.

8. A clip substantially as described herein with reference to the accompanying drawings.

9. An assembly of a clip as claimed in claim 1 and two apertured members, the clip passing through the apertures in the members so that one member is rigid with the clip and the other is pivotable relative to the clip.

10. An assembly of a clip and two apertured members substantially as described herein with reference to Figure 1 of the accompanying drawings.

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